

Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Marmaton River

Waterbody Segment at a Glance:

County: Vernon
Nearby Cities: Nevada
Length of impairment: 49.5 miles
Pollutant: Low Dissolved Oxygen
Source: *

*The U.S. Environmental Protection Agency did not specify a source for this listing



State map showing location of watershed

TMDL Priority Ranking: Medium

Description of the Problem

Beneficial uses of Marmaton River

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption
- Irrigation

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

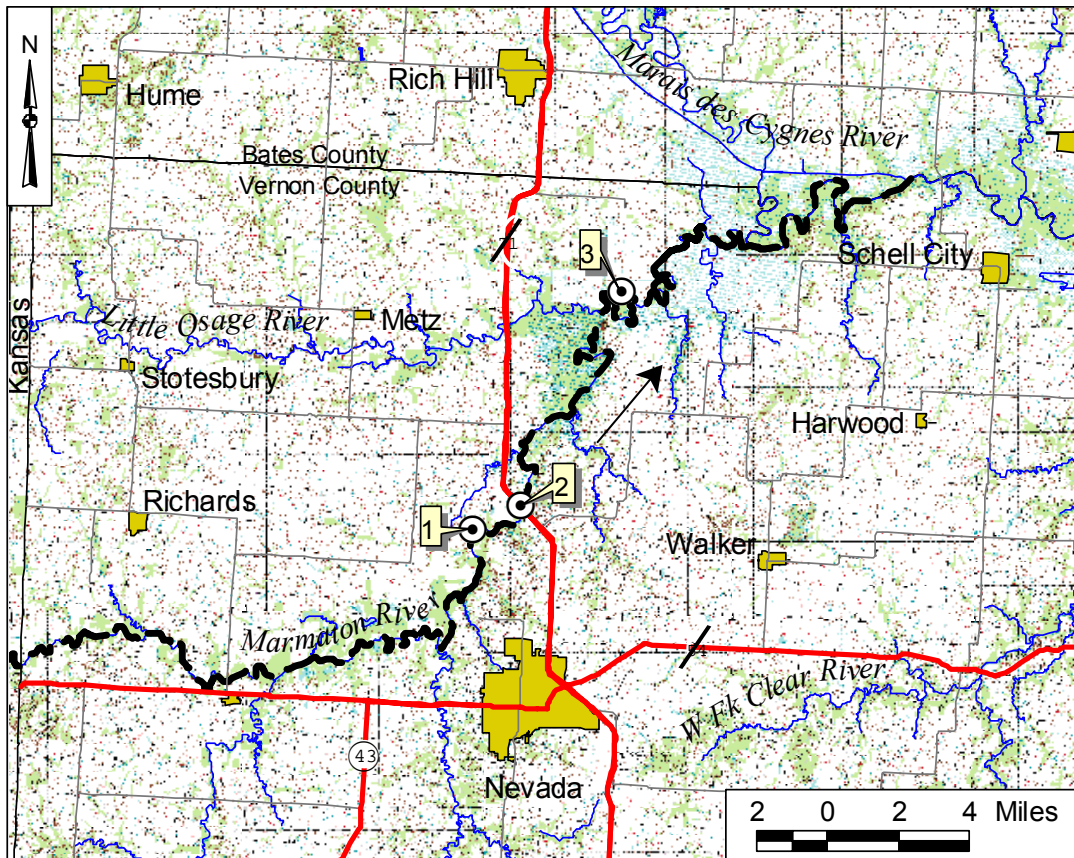
- State Water Quality Standards, 10CSR20-7.031, state that for protection of warm water aquatic life the dissolved oxygen level should be no lower than 5 mg/l or the normal dissolved oxygen profile of the stream, whichever is lower.

Background Information and Water Quality Data

Dissolved oxygen (DO) levels in the Marmaton River as measured during summer low flow periods at various locations have ranged from 1.9 to 9.6 mg/L (milligrams per liter or parts per million), with about 20 percent of the measurements below 5.0 mg/L. Most of the observed lower DO values have been near the Kansas state line and may have been influenced by the wastewater discharge from Fort Scott, Kansas. The range in DO is probably a function of just how small the flow in the stream is (if any) and how long the stream has been in this low flow condition. At the remaining water quality monitoring sites on the Marmaton, the observed DO levels appear to be due to the

normal amount of oxygen-demanding material entering a stream from an agricultural watershed. For these reasons, the river was proposed for deletion from the 303(d) list. EPA did not approve this proposal, stating the department “did not provide data to demonstrate that the background values for DO are non-anthropogenic, nor modify its water quality standards to include a site specific criteria or the designated use”. For the next listing cycle, the department will again request this river be delisted based on the recently approved 2004 listing methodology. The Marmaton River does not have adequate recent data to characterize DO levels (only two observations in the last seven years). The department is in the process of drafting new DO criteria in state water quality standards. These new criteria should clarify whether or not the observed DO levels in the Marmaton River exceed water quality standards. Also, a DO study is planned for the summer of 2005. Data and a map with sampling sites may be found below.

Marmaton River in Vernon County, Missouri, with Sampling Sites



----- Impaired Segment → Direction of Flow

Site Index	
1	Marmaton River near Dean Lake
2	Marmaton River at Highway 71
3	Marmaton River at Four Rivers Conservation Area

Dissolved Oxygen in Marmaton River near Dean Lake (Site #1)

<u>Date</u>	<u>Temperature (°C)</u>	<u>Dissolved Oxygen (mg/l)</u>	<u>Dissolved Oxygen Saturation</u>
8/10/1999	27	4.8	60%
7/29/2002	29	7.9	103%

Data Source: U.S. Army Corps of Engineers, Kansas City District

Dissolved Oxygen in Marmaton River at Missouri Highway 71 (Site #2)

<u>Date</u>	<u>Temperature (°C)</u>	<u>Dissolved Oxygen (mg/l)</u>	<u>Dissolved Oxygen Saturation</u>
7/1/1991	28	1.9	24%
7/16/1991	28	4.9	63%
8/6/1991	27	3.1	39%
8/27/1991	25	3.3	40%
9/24/1991	17	5.6	58%
6/23/1992	24	7	83%
4/12/1994	11	9.6	87%
5/10/1994	18	5.9	62%
6/14/1994	25	5.3	64%
7/12/1994	27	6.4	81%
8/16/1994	25	7.2	87%
9/6/1994	23	5.8	68%
10/11/1994	15	7.6	75%

Data Source: U.S. Army Corps of Engineers, Kansas City District

Dissolved Oxygen in Marmaton River at Four Rivers Conservation Area (Site #3)

<u>Date</u>	<u>Temperature (°C)</u>	<u>Dissolved Oxygen (mg/l)</u>	<u>Dissolved Oxygen Saturation</u>
9/9/1997	24	6.7	80%
9/9/1997	26	8.3	103%
9/10/1997	22	6.5	75%
9/10/1997	25	9.1	110%
9/11/1997	22	6.2	71%
9/11/1997	24	9.2	110%

Data Source: Missouri Department of Natural Resources

For more information call or write:

Missouri Department of Natural Resources

Water Protection Program

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